AMENDMENTS TO THE CLAIMS

1. (currently amended) Method for selective separation of each of the constituents of a mixture of synthetic organic materials that are polymers and/or copolymers, ~~in particular used, and~~ intended to be upgraded by recycling, having a density of at least 1, in fragmented form, ~~consisting of~~ comprising carrying out their separation by introducing said mixture into a dense liquid medium, which is an aqueous suspension of powder particles dispersed in an adequate amount in an aqueous phase, in order to create a density level ~~"ds"~~ chosen as the threshold for separation of the various fragmented synthetic organic materials to be selectively separated by type, ~~characterised in that~~ wherein said separating suspension is made selective, stable and invariant with regard to density at a precision level of ±0.0005 with respect to the density level threshold ~~"ds"~~ chosen for the selective separation:

a) by the size selection of powder particles having a granulometric cross-section of no more than 30 μm, which solid powder particles thus sized are dispersed and present in an aqueous phase in a sufficient amount to reach the chosen density level threshold ~~"ds"~~, and

b) by the implementation of at least one means of dynamic stabilisation by creating a circulating flow of said separating suspension, which circulating flow is at most 40 m^3/h.

2. (currently amended) Method according to claim 1, ~~characterised in that~~ wherein said separating suspension is made selective, stable and invariant with regard to density at a precision level of ±0.0005 with respect to the density level threshold ~~"ds"~~ chosen for the selective separation, by the size selection of solid powder particles of which the granulometric cross-section is ~~preferably~~ no more than 20 μm, ~~and very preferably no more than 5 μm,~~ which solid powder particles thus sized are dispersed and present in an aqueous phase in a sufficient amount to reach the chosen density level threshold ~~"ds"~~.

3. (currently amended) Method according to claim 1, ~~characterised in that~~ wherein the powder particles are of natural origin and are ~~chosen~~ selected from the group of powder mineral materials ~~constituted by~~ consisting of clays belonging to the families formed by the group of

kaolinites, ~~including, kaolinite, dickite, halloysite, disordered kaolinites, serpentines,~~ the group of micas, ~~in particular, muscovite, biotite and paragonite, pyrophyllite and talc, illites and glauconite,~~ the group of montmorillonites, ~~in particular beidellite, stevensite, saponite and hectorite; the group of chlorites;~~ the group of vermiculites,[[;]] the group of interstratified clays of which the unitary structure is a combination of the previous groups,[[;]] the group of fibrous clays, ~~in particular attapulgite (palygorskite) and sepiolite;~~ the group formed by calcium carbonate ~~(calcite)~~, magnesium carbonate, dolomite ~~(double carbonate of calcium and magnesium)~~, calcium sulphate dihydrate ~~(gypsum)~~, barium sulphate, talc, alumina, silica, titanium dioxide and zirconium.

4. (currently amended) Method according to claim 1, ~~characterised in that~~ wherein the powder particles are of synthetic origin and are ~~chosen~~ selected from the group consisting of glass powders, calcium carbonate precipitate and metallic powders.

5. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 4~~, ~~characterised in that~~ wherein the powder particles have a median diameter of no more than 5 μm ~~and preferably between 1 μm and 0.005 μm~~.

6. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 5~~, ~~characterised in that~~ wherein the means of dynamic stabilization are selected from the group consisting of agitation by means of an agitation rotor, internal recirculation of the suspension by means of the agitation rotor, external recirculation of the suspension by means of a pump by withdrawing the suspension from the base of the container where it is located and by reinjection into the upper portion of said container, ~~or by~~ and a combination of means enabling both the agitation by means of an agitation rotor and the internal and/or external recirculation of the suspension.

7. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 6~~, ~~characterised in that~~ wherein the means of dynamic stabilisation ~~consist of~~ comprise continuous or non-continuous recirculation of the suspension.

8. (currently amended) Method according to claim 1, ~~characterised in that~~ wherein the circulating flow of the separating suspension is between 5 and 30 m^3/h ~~and preferably between 5 and 15 m^3/h~~.

9. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 8~~, ~~characterised in that~~ wherein the circulating flow of the separating suspension is adjusted at an hourly turnover rate of said suspension between 0.5 and 4 ~~and preferably between 0.5 and 2~~.

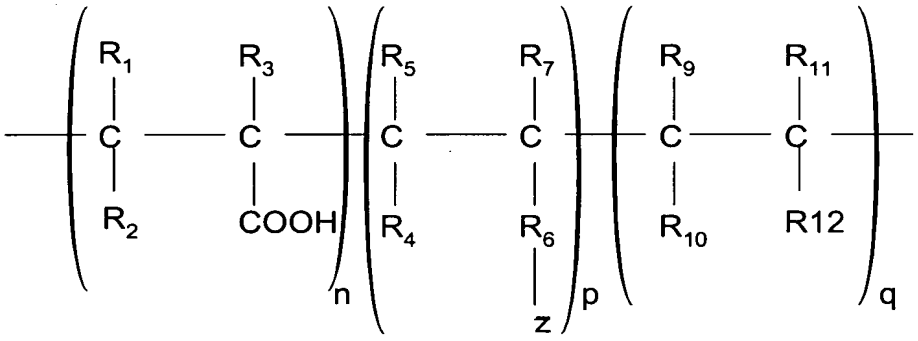
10. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 9~~, ~~characterised in that~~ wherein the aqueous phase has a conductivity of no more than 50 ms ~~and preferably between 0.2 ms and 40 ms~~.

11. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 10~~, ~~characterised in that~~ wherein a water-soluble agent for assisting with the stabilization of the rheological and invariance characteristics of the ~~apparent~~ density ~~"ds"~~ level threshold of the solid powder particle suspension is added to said suspension.

12. (currently amended) Method according to claim 11, ~~characterised in that~~ wherein the water-soluble agent for assisting with the stabilization of the rheological and invariance characteristics of the ~~apparent~~ density ~~"ds"~~ level threshold of the solid powder particle suspension is ~~chosen~~ selected from the group consisting of phosphates and polyphosphates, alkylphosphate esters, alkylphosphonate, alkylsulphate, alkylsulfonate, lignin, lignosulfonates in the form of calcium, sodium, iron, chromium, or iron and chromium salts, maleic anhydride and sulfonic styrene acid copolymers, substituted, neutralised, esterified or non-esterified methylacrylamide and (methyl)acrylic acid copolymers, methylacrylamide-alkyl sulfonic acid and (methyl)acrylamide copolymers, water-soluble acrylic acid polymers used in acid form or, optionally, entirely or partially neutralised by alkaline and/or alkaline-earth agents, by amines

and/or salified by monovalent and/or polyvalent ions, and/or esterified, ~~or from~~ and water-soluble acrylic copolymers having phosphatized, phosphonated, sulfated or sulfonated functions.

13. (currently amended) Method according to ~~either one of~~ claim[[s]] 11 ~~and 12~~, ~~characterised in that~~ wherein the water-soluble stabilisation agent is ~~preferably~~ selected from the water-soluble acrylic copolymers, having the general formula:



wherein

- ~~Z~~ is a phosphate, phosphonate, sulfate or sulfonate motif having at least one free acid function,

- n has a value between 0 and 95,

- p has a value between 95 and 5,

- q has a value between 0 and 95,

- the sum of n + p + q is equal to 100,

- R_1 and R_2 can simultaneously be hydrogen, or while one is hydrogen, the other can be a carboxylic function esterified or not by an alcohol in C_1 to C_{12},

- R_3 can be hydrogen or an alkyl radical in C_1 to C_{12},

- R_4 and R_5 are, simultaneously or not, hydrogen or an alkyl radical in C_1 to C_{12}, a substituted or unsubstituted aryl, a carboxylic function esterified or not by an alcohol in C_1 to C_{12},

- R_6 is a radical that establishes the bond between the motif ~~Z~~ and the polymer chain, which radical R_6 can be an alkylene of formula $(CH_2)_r$ in which r can have the values in the

interval 1 to 12, an alkylene oxide or polyoxide of formula ~~(~~R_8——O~~)~~$_s$ in which R_8 is an alkylene in C_1 to C_4 and s can have a value from 1 to 30, or a combination of the two formulas ~~(~~CH_2~~)~~$_r$ and ~~(~~R_8——O~~)~~$_s$,

- R_7 is hydrogen or an alkyl radical in C_1 to C_{12},

- R_9 and R_{10} are simultaneously hydrogen, or while one is hydrogen, the other is a carboxylic grouping, an ester in C_1 to C_{12}, , an alkyl in C_1 to C_{12}, or an alkylaryl,

- R_{11} is hydrogen, a carboxylic grouping, an alkyl in C_1 to C_3 or a halogen,

- R_{12} is an ester in C_1 to C_{12}, a substituted or unsubstituted amide, an alkyl in C_1 to C_{12}, an aryl in C_5 or C_6, an alkylaryl, a halogen, a carboxylic grouping or a phosphatized, phosphorated, sulfated or sulfonated alkyl or aryl grouping.

14. (currently amended) Method according to claim 13, ~~characterised in that the motif~~ wherein Z~~, the non-free acid functions are occupied by~~ comprises a cation, an ammonium grouping, an amine, an alkyl in C_1 to C_3, a substituted or an unsubstituted aryl in C_3 to C_6, an alkylaryl, an ester in C_1 to C_{12}, ~~preferably in C_1 to C_3,~~ or a substituted amide.

15. (currently amended) Method according to claim 13, ~~characterised in that~~ wherein, in the sum of $n + p + q$, $n = 0$, when $q > 0$, and $q = 0$ when $n > 0$.

16. (currently amended) Method according to claim 13, ~~characterised in that, in the motifs~~ wherein R_1 and R_2~~, the alcohol esterifying the carboxylic function is preferably in~~ are a C_1 to C_4 alcohol esterifying a carboxylic function.

17. (currently amended) Method according to claim 13, ~~characterised in that,~~ wherein ~~in the motif~~ R_3, ~~the alkyl radical is preferably in~~ is a C_1 to C_4 alkyl radical.

18. (currently amended) Method according to claim 13, ~~characterised in that, in the motifs~~ wherein R_4 and R_5~~, the alkyl radical is preferably in~~ are C_1 to C_4 alkyl radicals.

19. (currently amended) Method according to claim 13, ~~characterised in that, in the motifs~~ wherein R_4 and R_5~~, the alcohol esterifying the carboxylic function is preferably in~~ are C_1 to C_4 alcohols esterifying a carboxylic function.

20. (currently amended) Method according to claim 13, ~~characterised in that, in the motif~~ wherein R_7~~, the alkyl radical is preferably in~~ is a C_1 to C_4 alkyl radical.

21. (currently amended) Method according to claim 13, ~~characterised in that, in the motifs~~ wherein R_9 and R_{10}~~, the ester is preferably in~~ are C_1 to C_3 esters.

22. (currently amended) Method according to claim 13, ~~characterised in that, in the motifs~~ wherein R_9 and R_{10}~~, the alkyl is preferably in~~ are C_1 to C_3 alkyl.

23. (currently amended) Method according to claim 13, ~~characterised in that, in the motif~~ wherein R_{12}~~, the ester is preferably in~~ is a C_1 to C_5 ester.

24. (currently amended) Method according to claim 13, ~~characterised in that, in the motif~~ wherein R_{12}~~, the alkyl is preferably in~~ is a C_1 to C_3 alkyl.

25. (currently amended) Method according to claim 13, ~~characterised in that~~ wherein the molecular weight of the water-soluble acrylic copolymers forming the stabilisation agent is ~~between~~ from 5000 ~~and~~ to 100,000.

26. (currently amended) Method according to claim 13, ~~characterised in that~~ wherein the water-soluble acrylic copolymers forming the stabilisation agent are at least partially neutralised, by means of a neutralisation agent ~~chosen~~ selected from the group consisting of sodium, potassium, ammonium, calcium and magnesium hydroxides, and primary, secondary and tertiary amines, aliphatic and/or cyclic, ~~in particular~~ mono-, di- and tri-ethanolamines, mono- and diethylamines, cyclohexylamine and methylcyclohexylamine.

27. (currently amended) Method according to ~~any one of~~ claim[[s]] 10 ~~to 13~~, ~~characterised in that~~ wherein the weight of the water-soluble stabilisation agent, expressed as a dry/dry weight percent of said agent with respect to the weight of the powder particles in suspension, is ~~between~~ from 0.02 % ~~and~~ to 5 %~~, and preferably between 0.1 % and 2 %~~.

28. (currently amended) Method according to ~~at least one of~~ claim[[s]] 1 ~~to 27~~, ~~characterised in that~~ wherein said method is performed in at least one hydraulic separator equipped with at least one dynamic stabilisation means.

29. (currently amended) Method according to claim 28, ~~characterised in that,~~ wherein when said method is performed in a single hydraulic separator, the chosen density ~~"ds"~~ level threshold changes:

- in the increasing direction, by a controlled addition of predefined and selected powder particles to the suspension present in the hydraulic separator, until the new chosen threshold density ~~"ds"~~ is reached,

- in the decreasing direction, by adding water until the new chosen threshold density ~~"ds"~~ is reached.

30. (currently amended) Method according to claim 29, ~~characterised in that~~ wherein the change in density of the stable separating suspension, in an increasing or decreasing direction, is carried out under agitation by means of an agitation rotor and/or internal recirculation of the aqueous medium and/or recirculation of the dense medium by withdrawing the dense aqueous medium from the base of the hydraulic separator and reinjecting it into the top portion of said separator of the dense aqueous medium being adjusted.

31. (currently amended) Method according to claim 28, ~~characterised in that~~ wherein, if said method is performed in a plurality of hydraulic separators, the various separators are placed one

after another, in a cascade system functioning with stable suspensions each having a specific density threshold ~~"ds"~~, in an increasing or decreasing order of density.

32. (currently amended) Method according to ~~any one of~~ claim[[s]] 28 ~~to 31~~, ~~characterised in that~~ wherein the threshold density ~~"ds"~~ level of the aqueous suspension for fine separation is continuously controlled by appropriate measurement means and subjected to an adjustment when any deviation is detected.

33. (currently amended) Method according to claim 32, ~~characterised in that~~ wherein each hydraulic separator is controlled with regard to the density of the dense medium that [[it]] each separator contains by means of two electrical valves each opening onto two circuits connected to two tanks, one of the tanks containing a [["]]mother[["]] suspension with a concentration of ~~around~~ about 60 % powder particles, stabilised by a water-soluble stabilizing agent, enabling a predetermined amount of the mother suspension to be added, which adjusts upward any deviation toward a reduction in the density of the dense medium for fine separation, and the other tank containing water enabling a predetermined amount to be added so as to adjust downward any deviation toward [[in]] an increase in the density of the dense medium for fine separation.

34. (currently amended) Method according to claim 33, ~~characterised in that~~ wherein, in each hydraulic separator, the measurement of the density of the dense medium is performed continuously by ~~suitable~~ at least one measuring apparatus[[es]] that activates the opening of one or the other of the electrical valves, then the closing thereof when the threshold density level ~~"ds"~~ is reached.

35. (currently amended) ~~Use of the~~ A method ~~according to at least one of claims 1 to 34 for the~~ for selective separation of a mixture of polymer materials~~, in particular used,~~ obtained from the destruction of automobiles and/or durable consumer goods that have reached the end of their serviceable lives comprising implementing the method of claim 1.